Semantic Language and Tools for Reporting Human Factors Incidents, Phase I

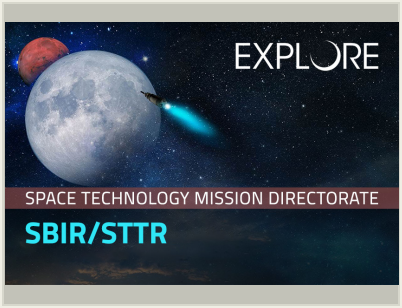
Completed Technology Project (2009 - 2009)

Project Introduction

Incidents related to impaired human performance in space operations can be caused by environmental conditions, situational challenges, and operational deficiencies. Detecting, reporting, and correlating related incidents are key to preventing future incidents. NASA has made significant progress in standardizing the reporting of aviation incidents by developing electronic forms for reporting incidents. While such forms improve report consistency, incident data are not represented in a way that enables computer-based reasoning across reports (e.g., automatic linking of related reports.) TRACLabs proposes to develop a human factors incident-reporting tool for gathering incident data, documenting data in incident reports, and archiving incident data. We will define an XML-based semantic language for incident reporting to capture information about human factors incidents, including multi-modal data. We will develop software for authoring incident reports using this language, archiving these reports, and searching the archives using incident semantics. This project is innovative in defining an incident reporting language that uses an ontology-based vocabulary. This enables improved tools for gathering incident data, and for authoring and archiving incident reports. The semantic indexing provided by the use of incident reporting language permits more sophisticated search of archives, including automatic identification of prior incidents potentially relevant to the current incident.

Anticipated Benefits

Potential NASA Commercial Applications: Commercial tools for incident reporting are available in a diverse range of domains from crime incidents to corporate security incidents to customer complaints. Like the proposed software, most of these products support electronic submission and reporting of incident data, and archival of incident reports. The proposed approach differs from these commercial tools in providing a semantic basis for customization and improved search, and in representing incidents in an XML-based language. Such capabilities permit applying much of the incident reporting software developed for NASA in non-NASA applications. Promising applications include reporting incidents arising in chemical and nuclear plants, such as incidents arising from human error during plant operations, and reporting medical incidents, such as incidents that arise when monitoring the aged or impaired in performing the activities of daily living.



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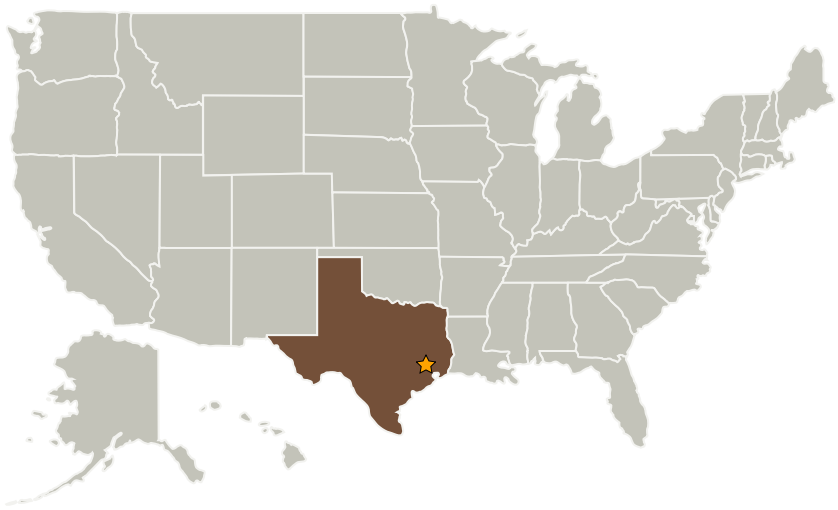
Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
★Johnson Space Center(JSC)	Lead Organization	NASA Center	Houston, Texas
TRACLabs, Inc.	Supporting Organization	Industry	Webster, Texas

Primary U.S. Work Locations
Texas

Project Transitions

January 2009: Project Start

July 2009: Closed out

Closeout Summary: Semantic Language and Tools for Reporting Human Factor s Incidents, Phase I Project Image

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Johnson Space Center (JSC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

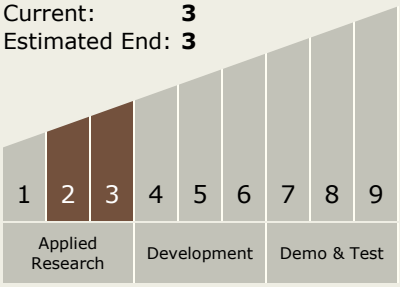
Carlos Torrez

Principal Investigator:

Debra L Schreckenghost

Technology Maturity (TRL)

Start: **2**
Current: **3**
Estimated End: **3**



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Technology Areas

Primary:

- TX11 Software, Modeling, Simulation, and Information Processing
  - TX11.4 Information Processing
    - TX11.4.2 Intelligent Data Understanding